

Pathway to 21st Century Skills: A Collaborative Model

Technology in Nevada Schools
2009-2014

The Educational Technology Plan of
The Nevada Commission on Educational Technology and
The Nevada Department of Education

Approved by the Nevada Commission on Educational Technology on January 21, 2009



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Table of Contents

Nevada Commission on Educational Technology	iii
Acknowledgements.....	iv
Executive Summary.....	v
Introduction	v
Goals for Success 2009 - 2014	v
Progress Targets.....	v
Development and Revision Process.....	vi
Pathway to 21 st Century Skills: A Collaborative Model.....	1
Technology in Nevada Schools 2009 – 2014.....	1
Introduction	1
Defining the Need for Change	1
Call to Action.....	2
Building, Executing and Evaluating the Plan.....	3
Development.....	3
Implementation	4
Evaluation	4
Goals for Success.....	5
Underlying Ideology of the Goals for Success.....	5
2008 Nevada State Improvement Plan	5
21 st Century Schools and Learners.....	5
Collaboration.....	5
Goal 1: Infrastructure and Connectivity.....	6

Goal Statement	6
Rationale	6
Benefits for Learning.....	6
Reality in Nevada	6
Target 1	7
Target 2	7
Target 3	8
Goal 2: Professional Development.....	9
Goal Statement	9
Rationale	9
Benefits for Learning.....	9
Reality in Nevada	9
Target 1	10
Target 2	11
Goal 3: Instructional Integration.....	12
Goal Statement	12
Rationale	12
Benefits for Learning.....	12
Reality in Nevada	12
Target 1	13
Target 2	13
Target 3	14
Target 4	14
Glossary of Terms.....	15
Bibliography	16

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NRS 388.795

5. The Commission shall:

- (d) Submit to the Governor, the Committee and the Department its plan for the use of educational technology in the public schools of this State and any recommendations for legislation.
- (e) Review the plan annually and make revisions as it deems necessary or as directed by the Committee or the Department.

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Executive Summary

Introduction

In Nevada today, we find ourselves in a new world. Economic and workforce pressures, brought on largely by globalization and the resulting shift of routine work overseas, require a rigorous self-examination of what we do in schools to prepare students to thrive in an increasingly digital and interconnected global society.

Our schools find themselves competing with new and exciting media-rich environments for entertainment and social communications. Our students engage in meaningful communication outside of school using Web 2.0 and other highly mobile technologies and structures. They collaborate as digital, global citizens to address real-world, relevant issues.

The challenge, then, is to transform our industrial education model with modern tools, strategies, and learning resources to prepare our young learners for their futures. The following executive summary outlines the plan of the State of Nevada to do just that.

Goals for Success 2009 - 2014

Three goals drive this plan addressing the following critical areas:

- Robust infrastructure and connectivity supporting digital-age learning and teaching,
- Professional growth for educators to improve student learning with technology, and
- Instructional technology integration across the curriculum to engage digital learners.

These goals will be achieved in a culture of collaboration among all stakeholders to ensure students across the State master 21st Century skills including the Nevada Educational Technology Standards for Students. The rationale justifying each of these goals, and the anticipated learning benefits, are included in the text of this plan.

Progress Targets

Action plans for achievement of the Goals for Success are delineated as multiple Progress Targets organized in support of each goal. Details included in this plan for each Progress Target are:

- Action steps for achieving each target,
- Responsible party for ensuring achievement,
- Timeline for onset, and
- Outcome(s) of success.

The chart at the end of this Executive Summary identifies the Progress Targets organized by each Goal of Success to which it maps. Progress targets include development and adoption of educational technology standards for Nevada students, teachers, and administrators.

Development and Revision Process

This plan was created through a statewide collaborative effort by representatives of Nevada school districts and schools, the International Society for Technology in Education (ISTE), the Nevada Commission on Educational Technology (CET), the Nevada System of Higher Education (NSHE), Nevada Parent Teacher Association, rural and urban businesses, public broadcasting, and the Nevada Department of Education (NDE). An array of Nevada data, national and global trends, state educational technology plans of other states, and other State of Nevada plans were considered in the development of this plan.

At least annually, the Nevada Department of Education will:

- Report progress on this plan to the Nevada Commission on Educational Technology (CET),
- Develop a funding request for the subsequent year of implementation of this plan, and
- Lead education stakeholders through a review and revision (as warranted) of the plan.

Progress Targets Organized by Goals of Success

Goal 1 – Support robust infrastructure and connectivity fostering digital-age learning and teaching

Target 1 – Identify and appoint liaisons who will be responsible for communicating and coordinating with NDE to address infrastructure issues at all grade levels

Target 2 – Identify technology infrastructure resources within each district

Target 3 – Identify technological infrastructure and support needs to devise a statewide upgrade schedule

Goal 2 – Support professional growth for educators to improve student learning with technology

Target 1 – Promote the importance of strong technology-related professional development for educators

Target 2 – Increase quality technology-related professional development opportunities for educators, including online offerings

Goal 3 – Support instructional technology integration across the curriculum to engage digital learners

Target 1 – Develop and implement new statewide policies that support classroom technology integration

Target 2 – Support innovative programs that engage students through the use of current and emerging technologies

Target 3 – Support districts in planning and implementation of technology resources and instructional strategies in all content areas

Target 4 – Integrate the new State technology standards into other content area standards, thereby, fostering district support of classroom technology integration

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Introduction

Defining the Need for Change

Imagine a classroom where students engage in a videoconference with an expert from Iceland to discuss global warming and its effects. Imagine a classroom where a group of English language learners collaborate and create a podcast on the Internet for all to hear. How about a classroom where students access resources on the Internet from handheld devices? Actually, you can see these examples of 21st Century learning today if you visit Coronado High School in Clark County, Agnes Risley Elementary School in Washoe County, Lovelock Elementary School in Pershing County, and at several other schools throughout Nevada. What keeps this from happening in all Nevada schools?

It's a changed world. We have moved past the millennium into the 21st Century and into an increasingly global economy. Technology has transformed the world into a global community where the workplace is constantly evolving in response to changing demands. For Nevada to take a vital place in this changed world, it must attract companies and investors. Policy makers and educators must work together to prepare a workforce that can compete. Across the globe and in Nevada, growth in technology has transformed every aspect of business, government, society and life. It's time education is transformed, as well. As stated by the State Educational Technology Directors Association (2007):

No industry or organization can remain competitive today without making comprehensive use of technology as a matter of course in all of its operations. Schools are no different. Yet technology—which has transformed business practices and fueled productivity growth since the mid-1990s—is the critical “how” that is largely missing from education improvement efforts. In fact, education is the least technology-intensive enterprise in a ranking of technology use among 55 U.S. industry sectors, according to the U.S. Department of Commerce.

Educational statistics call into question the abilities of students to compete in the global job market. The United States ranks 48th out of 124 countries in its quality of math and science education (Global Information Technology Report 2007-2008, 2008). In the most recent *Technology Counts* (2008) report released by Education Week, Nevada ranked at the bottom of all states. Nevada was one of four states to receive an overall grade of 'D' and earned an 'F' in the ability to meet the needs of its students and to provide the skills that students need to function successfully in a global economy.

The *Nevada Schools Educational Technology Needs Assessment* (Hartley, 2008) indicates 40% of Nevada classrooms are not equipped with a computer for student use. While almost all teachers in the state have a computer in their classrooms for administrative purposes, 40% of those computers are four years old or older. The report further posits that parents expect technology to be used regularly during the school day. It concludes, “Overall, the technology needs of Nevada classrooms and schools remain

immense and in need of continued and consistent support.” Yet Nevada is currently funding education at a national low (Per Pupil Expenditures by State, 2004). In the wake of the current economic downturn, all funding for educational technology was recently cut from the 2008 Nevada budget.

Research on student learning indicates that well-implemented classroom technology integration has a positive effect on student achievement and engagement (ISTE, 2008b). In a recent article in the University of Nevada, Reno’s student magazine, *Insight* (Pacheco & Chacon, 2008), UNR professors and students describe the current undergraduate population as techno-savvy, yet globally unaware and incapable of conducting simple research. Today’s K-12 students have more technology at their fingertips than any other generation before them; however, they are not learning how to use these technologies to achieve academic success. Many of today’s teachers are not digital natives and must be trained to effectively use technology in the classroom. Effective classroom technology integration is the bridge that invites millennial learners to be successful, engaged, classroom learners – the kind of learners who grow up to become productive, digital age citizens and workers.

The pathway to educating 21st Century students requires collaborative leadership at the State, district, school, and community levels. Certainly, there are obstacles to overcome. Finding creative solutions to these obstacles will be challenging, but it is not impossible.

Call to Action

As reflected in the *2008 Nevada State Improvement Plan* (Nevada Department of Education, 2008), Nevada faces great challenges posed by changing state demographics and the needs of an increasingly global, technology-based economy. The diversity of the student demographics in Nevada has broadened while the knowledge and skills needed for future work have changed. So too must change happen in the fundamentals of the Nevada educational system. Schools must provide learning experiences that prepare students to meet these needs. In a social context, students engage in meaningful communication outside of school using Web 2.0 and other highly mobile technologies and structures. They collaborate as digital, global citizens to address real-world, relevant issues. But in most classrooms, the old industrial model endures. The challenge, then, is to transform the education model with modern tools, strategies and learning resources to prepare learners for their futures.

Essential to this shift are the following factors:

- Stakeholders must collaborate to find creative solutions to problems,
- The goals of this plan must be implemented,
- Ongoing evaluation and revision of this plan must occur, and
- Long-range, sustainable, state funding must be allocated for educational technology.

The question is no longer if technology should be integrated into Nevada's classrooms; the question is how to support classroom technology integration in Nevada schools to prepare digital age students for the future. Imperative to fueling this shift is a sufficient, dedicated funding stream for educational technology that is tied to sustained, high-quality, professional development and a long-range investment in hardware, software, and infrastructure. The best investment the 2009 Nevada Legislature can make in Nevada’s economy is to bring education in Nevada into the 21st Century by supporting the goals of this plan with ongoing, sustained funding. The students of today must have the tools they need to become the productive citizens of tomorrow.

Building, Executing and Evaluating the Plan

Development

This plan was created through a statewide collaborative effort by representatives of Nevada school districts and schools, the International Society for Technology in Education (ISTE), the Nevada Commission on Educational Technology (CET), the Nevada System of Higher Education (NSHE), rural and urban Nevada businesses, the Nevada Parent Teacher Association, The Corporation for Public Broadcasting, and the Nevada Department of Education (NDE). Two ISTE process facilitators and one representative from NDE co-chaired the committee and guided members through activities to build this plan.

The plan was created during an intensive, three-month period through monthly committee meetings that informed interim subcommittee work. Interim work was conducted electronically through such means as Google Docs, online meetings, an online forum, and conference calls. An advisory subcommittee of stakeholders worked with NDE staff to plan committee meetings. The Nevada Computer and Technology Academic Standards were also revised simultaneously, setting the course for this plan to align with the standards. Many of the members of the Nevada Educational Technology Advisory Committee are also on the technology standards revision committee. Additionally, the ISTE process facilitators co-chaired the committees that created the *National Educational Technology Standards* and the *National Educational Technology Plan*.

Several relevant sources were consulted throughout this process. The committee reviewed the educational technology plans of Virginia (Virginia Department of Education, 2003), Texas (Texas Education Agency, 2006), South Dakota (South Dakota Department of Education, 2003), Arizona (Arizona Department of Education, 2002), and Georgia (Georgia Department of Education, 2003) as well as the *National Educational Technology Plan* (U.S. Department of Education, 2004). During a 2008 CET meeting, Commissioners recommended following a format similar to the *2003-09 Educational Technology Plan for Virginia* and the committee agreed with this recommendation. Additionally, the ideas presented in the *Nevada Schools Educational Technology Needs Assessment of 2008* (Hartley, 2008), the *National Educational Technology Standards (NETS) for Students* (ISTE, 2007), the *NETS for Teachers* (ISTE, 2008a) and the *NETS for Administrators* (ISTE, 2002), and the *2008 Nevada State Improvement Plan* (Nevada Department of Education, 2008) were considered.

The committee considered potential goals for the plan and identified the following three:

1) Connectivity and Infrastructure, 2) Professional Development, and 3) Instructional Integration. In addition to these three, 21st Century Skills, and Communication and Collaboration also were identified as goals. These concepts, in addition to the goals of the *2008 Nevada State Improvement Plan*, were deemed so central to the ideas set forth in this plan that they were woven into the underlying concepts of each goal and target.

Implementation

This plan will guide the educational technology efforts of the Nevada Department of Education and Nevada school districts. District and school educational technology plans will align to this plan. Initial strategies to make this an effective document include:

- Disseminating the plan at the state and district levels;
- Holding a statewide implementation workshop for district teams;
- Collecting data to inform future educational technology plans and decisions;
- Beginning the process of integrating the technology standards with core subject area standards;
- Working to adopt ISTE National Educational Technology Standards for Teachers and Administrators;
- Developing an online technology-planning tool to streamline the writing and collection of district educational technology plans;
- Developing a funding request for the subsequent year of implementation of this plan; and
- Developing a collaborative website where ideas and solutions may be shared across districts.

Evaluation

Since this plan is the guiding force behind NDE's educational technology efforts, it is essential to conduct formative and summative evaluation on the progress made toward accomplishing the plan's goals and targets. Evaluation will occur in the following ways:

- NDE will report annual progress on this plan to the Nevada Commission on Educational Technology (CET);
- NDE will lead education stakeholders through an annual review and revision (as warranted) of the plan; and
- The Nevada Educational Technology Advisory Committee will meet at least twice per year to evaluate progress made on the plan's goals and targets.

Goals for Success

Three goals drive this plan, 1) Infrastructure and Connectivity, 2) Professional Growth, and 3) Instructional Technology Integration and are described in the following sections. The overarching goal of the *2008 Nevada State Improvement Plan* was considered throughout the creation of this plan. Additionally, 21st Century skills and statewide collaboration will play a central role in implementing this plan. The following statements are the underlying concepts that support every goal and target of this plan.

Underlying Ideology of the Goals for Success

2008 Nevada State Improvement Plan

The overarching goal of the *2008 Nevada State Improvement Plan* is to effectively deliver a rigorous and relevant standards-based education that increases student achievement, reduces the achievement gap, and prepares each student for a wide range of post secondary options. This goal is the overarching goal of this plan, as well.

21st Century Schools and Learners

An effective 21st Century school replicates the experiences successful Americans have in the post-high school world. Like successful workers, educators and students work in teams, take responsibility for the success of the system they belong to, and are able to think and act creatively and critically. Learning experiences infuse the traditional basics with the new 21st Century skills of global awareness, financial, economic and business literacy, civic literacy, and information and technology literacy. Schools can motivate students and provide real-world learning experiences by planning for and providing a 21st Century education. Creating a context of real-world experiences takes advantage of students' comfort levels with technology and their need for autonomous exploration.

Collaboration

To effectively implement the goals of this plan, stakeholder collaboration is central to its success. The integration of technology into all curriculum areas will require collaboration of many stakeholders in the greater community served by Nevada school districts. These include, but are not limited to, public service media, corporations, foundations, higher education, as well as district administrators, support staff, and teachers. Within the state, collaboration will occur across disciplines and include districts, virtual schools, and charter schools. Technologies, such as online meeting applications, video conferencing technologies, online forums, and online professional development tools, will be used to facilitate statewide collaboration.

Goal 1: Infrastructure and Connectivity

Goal Statement

Establish and sustain a robust technological infrastructure including connectivity needs at district and school levels.

Rationale

In order to teach 21st Century skills to students, they must have reliable and stable access to a network and the internet. This is of utmost importance in the digital age. Students and staff must have all the tools and resources needed for students to learn these skills.

Benefits for Learning

- Students will use current technologies that support learning.
- There will be increased and ongoing dialog between districts to ensure that the state as a whole is heading in the same direction thereby, identifying technology gaps and facilitating the sharing of resources.
- Districts with greater technology infrastructure can assist other districts. In the midst of budget crisis, it is prudent for districts to share resources rather than to work in isolation.
- Districts will have improved decision-making through the collection and analysis of baseline infrastructure data.

Reality in Nevada

- Not all districts have the necessary technological tools to make informed decisions.
- There is a paucity of information on current inventories and capabilities of equipment at the district and school levels.
- Most if not all districts have an idea about their technological infrastructure needs, but no formal system is in place to keep the infrastructure up-to-date.
- No system is in place that supports sustainable resources to improve student achievement and engagement through classroom technology integration.

Target 1

Identify and appoint liaisons who will be responsible for communicating and coordinating with NDE to address infrastructure issues at all grade levels

Action Step	Responsible	Onset	Resources Needed	Outcomes
Identify infrastructure liaison for each district	Representative from each district	2009 Spring	NDE and District staff	List of liaisons for each district
Organize the district infrastructure liaison committee	Representative from NDE and district tech liaison	2009 Spring	Contact information of key technology entities in each district. Funding for meetings	Ongoing contact and communication between all NV school districts

Target 2

Identify technology infrastructure resources within each district

Action Step	Responsible	Onset	Resources Needed	Outcomes
Inventory current technology equipment within each district and school	NDE to coordinate representative from each district	2009 Fall	State and district representatives Development committee Survey tools Funding for survey	Statewide inventory of technology equipment
Identify current connectivity/bandwidth within districts (WAN/LAN)	NDE to coordinate representative from each district	2009 Fall	State and district representatives Development committee Survey tools Funding for survey	Statewide list of connectivity capabilities

Target 3

Identify technological infrastructure and support needs to devise a statewide upgrade schedule

Action Step	Responsible	Onset	Resources Needed	Outcomes
Establish support needs	NDE to coordinate representative from each district	2010 Summer	District representatives Funding for meetings	Identification of statewide support needs
Established upgrade schedule	NDE to coordinate representative from each district	2010 Summer	District representative Funding for meetings	Establishment of statewide upgrade schedule

Goal 2: Professional Development

Goal Statement

Consistent, high-quality professional development will be provided to Nevada educators to improve classroom technology integration that supports 21st Century student achievement.

Rationale

If we are going to prepare 21st Century students, we need to prepare 21st Century teachers. Teachers need opportunities to learn new skills, improve technology skills, and use current technologies that support learning for their students. Professional development should be offered in a variety of ways, according to a statewide vision, over time. It should be embedded in and applicable to content areas, encourage higher order thinking skills, and suit adult learners.

Benefits for Learning

- Students will be engaged and challenged by teachers competent in 21st century skills.
- Students will have opportunities to learn with current technologies.
- Students will use technology in support of learning in all content areas, not in isolation.

Reality in Nevada

- There are exemplary programs in place, but they are not systemic or well-known.
- There are inequities in technology access, professional development opportunities, and funding.
- Technology integration in the classroom is teacher driven, rather than standards driven.
- There is no operational definition of quality technology PD or cohesive PD path for teachers (ongoing, sustained, supported, follow up, focused on student needs).

Target 1

Promote the importance of strong technology-related professional development for educators

Action Step	Responsible	Onset	Resources Needed	Outcomes
Research in technology requirements for teacher (re)certification in other states	Committee of district representatives led by NDE	2009 Spring	Committee members including higher ed Research results Information on NV licensure Funding for meetings	Document indicating best practices for teacher certification and recertification
Showcase master teachers and/or exemplary instructional practices using technology	Tech contact point person in each district NDE staff	2009 Fall	Place to post and tech support Volunteer from district will post to website Funding for development and maintenance of online resources Funding for meetings	Portal or Electronic Repository Identify and document master teachers and classrooms
Develop minimum standards for quality technology PD	Committee of district representatives led by NDE	2010 Spring	Nevada PD standards Funding	Documentation of quality technology PD and creation of an operational definition of quality technology PD

Target 2

Increase quality technology-related professional development opportunities for educators, including online offerings

Action Steps	Responsible	Onset	Resources Needed	Outcomes
Identify a set of optimal and comprehensive technology competencies for educators	Committee of district representatives led by NDE	2009 Spring	Statewide committee District coordination Funding	Create a set of teacher competencies
Provide/find a tool for documenting educator competencies	Committee of district and community representatives led by NDE	2009 Fall	Tools to evaluate and pilot Teachers to pilot Funding for pilot	Create a tool that can be used statewide to document educator competencies
Create a PD framework where teachers choose PD opportunities based on their identified technology needs	Committee of district and community representatives led by NDE	2010 Fall	Data from piloting competency tools Research on other states Committee work, using data, to develop a framework Collaboration tools (Centra, wiki, blog) Teacher Line courses Advertisement in all districts System (Centra, Blackboard, Angel) District information to share	Create a document outlining tech related PD opportunities that educators may use to select various PD opportunities
Provide quality technology related PD statewide	NDE Districts PBS Higher Ed	2011 Spring	Teacher Line courses Communication system for disseminating information about PD classes Distance Ed tools Funding	A variety of PD opportunities are offered statewide Outcome reports

Goal 3: Instructional Integration

Goal Statement

Technology will be integrated into all classrooms to enhance opportunities for student to develop 21st Century skills.

Rationale

A rich, technology integrated environment will prepare Nevada students to compete successfully in the digital age. This integration must occur equally across all curriculums, all teaching and all learning.

Benefits for Learning

- Students who use technology are engaged learners and therefore, less likely to disrupt the learning environment or to drop out of school.
- School leaders articulate and support a vision for the use of educational technologies so that teachers can effectively integrate technology into their teaching and learning.
- Student develop skills that allow them to use information and communication technologies to collaborate, construct knowledge and provide solutions to real-world problems.
- All educators and students will have access to relevant technology resources and services that support instructional goals.

Reality in Nevada

- Pockets of excellence using technology do exist in select Nevada schools, but these programs are often unique to projects or teachers.
- Instructional programs that support teaching 21st Century learning skills exist for some Nevada students but are not equally accessible across and within Nevada districts.
- Core content standards do not include integrated technology components.
- Nevada is not meeting the requirements of the Educational Data Exchange Network (EDEN) and Title II-D to provide US DOE with 8th grade technology competency data.

Target 1

Develop and implement new statewide policies that support classroom technology integration

Action Step	Responsible	Onset	Resources Needed	Outcomes
Work with districts to revise district technology plans that align with state plan	NDE and Districts	2009 Spring	Support from the NDE leadership District representatives Online tech plan collection tool	District tech plans will be aligned with the Nevada technology plan
Adopt NETS for Teachers	NDE	2009 Spring	Support from the NDE leadership NETS-T	Teacher standards are adopted
Adopt NETS for Administrators	NDE	2009 Spring	Support from the NDE leadership NETS-A	Administrator standards are adopted
Work with districts to simplify cross-district access to virtual schools already operating within the state	NDE, NV Virtual Schools, District representatives	2009 Fall	Support from the NDE leadership	Access to virtual schools is simplified
Begin process of evaluating 8 th graders' technology skills competency	NDE and Districts	2009 Fall	Support from the NDE leadership Database and online data collection tools	8 th grade technology skills data collected and provided to US DOE

Target 2

Support innovative programs that engage students through the use of current and emerging technologies

Action Step	Responsible	Onset	Resources Needed	Outcomes
Support the transformation of classroom practices in all curriculum areas by funding technology resources that address the diversity of learning styles and development of 21 st Century skills.	CET NV Legislature Governor NDE District Personnel	Contingent on funding	State Ed Tech Funding NDE and CET Personnel to distribute and monitor funding District personnel to implement programs	Increased student interaction with current and emerging technologies leading to increased student achievement and engagement

Target 3

Support districts in planning and implementing appropriate technology resources and instructional strategies in all content areas

Action Step	Responsible	Onset	Resources Needed	Outcomes
Assist district grant managers in locating outside funding to support technology resources that reach all learners	NDE and Districts	2009 Fall	Current information about funding sources Website	Funding is located to meet district needs
Assist district personnel in creating strategies for the use of educational technologies that support 21 st Century skills development	NDE and Districts	2009 Fall	Support from NDE and district leadership Collaboration time	NDE and districts create a repository of best practice strategies

Target 4

Integrate the new State technology standards into other content area standards, thereby, fostering district support of classroom technology integration

Action Step	Responsible	Onset	Resources Needed	Outcomes
Assist state curriculum consultants in incorporating technology into implementation of all content curriculum standards	NDE/State curriculum consultants	Dependent upon core subject standards' revision schedule	NDE staff District staff Funding	Technology standards will be integrated in all core content standards
Provide examples of technology integration in core subjects through development of a state repository of best practices	NDE and Districts	2010 Fall	Educators and sufficient bandwidth and storage space	Examples of technology integration will be published

Glossary of Terms

21st Century Skills-- Using information and communications technology (ICT) to gather and assess information, collaborate, innovate, think critically, and solve problems through real-world classroom projects and activities

Bandwidth - The speed at which a device connects to a District's network and the speed that the network connects to the Internet; sometimes called "connectivity"

Connectivity - The speed at which a device connects to a District's network and the speed that the network connects to the Internet; sometimes called "bandwidth"

CET – Nevada Commission on Educational Technology

Electronic Repository –Virtual sharing point for electronic documents; storage for electronic products or projects

Infrastructure - All equipment and devices needed to provide technology use for learning; hardware

ISTE – The International Society for Technology in Education

NDE—Nevada Department of Education

NETS-A – National Educational Technology Standards for Administrators

NETS-S – National Educational Technology Standards for Students

NETS-T – National Educational Technology Standards for Teachers

NSHE – Nevada System of Higher Education

PD – Professional Development

Portal - a Web site that functions as an entry point to the Internet by providing useful content and linking to various sites and features on the Internet

Stakeholders-- People who have a vested interest in the success of the project or who are involved in the implementation of the project

US DOE – United States Department of Education

Virtual School--An institution or organization that is not a "brick and mortar" structure; student services and courses are conducted through technology. Can be delivered through a network, and, even more currently, cell phone technology

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